

## CNSC-tech intership proposal

Ligerion: development of a dynamic portal-workstation for supercomputing systems

Target applicant	Software engineering and related (computing systems, electronics)
Level	Final year (M2) student, graduate
Starting date	Anytime from March 2021
Duration	3 to 6 months
Remuneration	Standard public internship agreement (Convention de stage) ~600€/mo
Where	Both <i>remote</i> and <i>ICI - Ecole Centrale de Nantes, Bat. T</i>
Application	Send CV + cover letter to <a href="mailto:davide.rovelli@ec-nantes.fr">davide.rovelli@ec-nantes.fr</a> or <a href="mailto:pierre-emmanuel.guerin@ec-nantes.fr">pierre-emmanuel.guerin@ec-nantes.fr</a>

### Brief

ICI is looking for a software engineering intern to further develop a supercomputing portal at its initial stage: a PHP web-application combined with a NodeJS API for supercomputer user management and remote job submission.

### Description

Supercomputing (or HPC) systems are relatively old systems when compared to more modern architectures such as Clouds. This often leads to a lack of flexibility in supercomputers having to support classic and modern workflows (batch scheduler, visualisation, virtualisation etc.). Being a fundamental resource for scientific R&D, there is a need for HPC systems to become more cloud-accessible to students and researchers without losing their current usability.

This is why our lab is developing Ligerion: a web portal + API + database service to request accounts, manage resources, submit and monitor jobs on all the supercomputer subsystems. This tool will be put in place on Liger, ECN supercomputer, and could also be proposed as interface for a distributed education cluster at a national level.

The intern will focus on the refactoring and development of Ligerion's PHP web interface and the NodeJS (Express) API, implementing new user and admin functionalities that simplify and aggregate relative supercomputer low-level operations.

### Desirable skills

- Web application and API development experience
- Confident usage of Linux
- Familiarity with PHP, NodeJS or JavaScript

- Familiarity with system applications (networking, scheduling etc.), supercomputing system knowledge is a bonus
- Basic knowledge of DevOps processes and technologies such as Ansible

## **The laboratory**

ICI, or *Institut de Calcul Intensif*, is a High Performance Computing Research Institute at Ecole Centrale de Nantes. ICI's primary role is to make state-of-the-art numerical tools for massively parallel computing more accessible and to develop innovative computing strategies integrating data and physical models for real-time simulation, addressing different applicative fields: manufacturing simulation, renewable energies, urban environment simulation and biophysical/biomechanical simulation. Visit <https://ici.ec-nantes.fr/> for more information.

## **The team**

You will be joining Centrale Nantes Supercomputer (CNSC-tech), the international team of software system engineers managing the supercomputer *Liger* at ICI. We develop and administrate the supercomputer's hardware and software in order to power scientific research in academic and industry. Our tasks range from mounting new servers in the datacenter to developing tools for high-level software applications with heavy focus on software infrastructure, DevOps and system programming. Visit <https://supercomputing.ec-nantes.fr> for more information.